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09/976,725	10/12/2001	Casimer M. DeCusatis	FIS920010131US1(14564)	2486

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EXAMINER	
CURS, NATHAN M	

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 09/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

-A

Office Action Summary	Application No. 09/976,725	Applicant(s) DECUSATIS ET AL.
	Examiner Nathan Curs	Art Unit 2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 August 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 11 and 18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 11 and 18 recite the limitation "means... to pass said set of optical signals... through the filter". The specification does not disclose filter bandpass where the one bandpass filter filters multiple channels/wavelengths as a set of signals. Page 3, lines 14-21 of the specification only discloses the network as a whole having a "set of optical signals" and discloses tracking changes to the set of signals by passing "each of the signals through a filter having a bandpass function". This disclosure only supports a single signal (i.e. one wavelength) going through a bandpass filter. The "set of optical signals" shown in figs. 1 and 2 show only that the network as a whole has a set of optical signals; these figures do not show the bandpass filter at all.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 3, the limitation "dither the center wavelengths of each of said set of signals" in line 7 is confusing because only one set of signals is claimed.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 3, 7-11 and 15-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Roberts (US Patent No. 5513029).

Regarding claim 3, Roberts discloses a method of adjusting for changes in optical signals transmitted through a multi-channel optical network, comprising: transmitting a set of optical signals through a network, each of the optical signals having a respective wavelength, and tracking changes to said set of signals by dithering the center wavelengths of each of the signals, passing each of the signals with dithering center wavelength through a filter having a bandpass function to generate a filter output signal, and using dither feedback to adjust the network or the set of optical signals to compensate for said changes to maintain a defined optical transfer function in the network (fig. 4, and col. 3, lines 51-63, col. 4, lines 4-40, and col. 12, line 41 to col. 13, line 63). Roberts discloses equalizing a wavelength's power by tapping the wavelength and using dither signal feedback at an inline EDFA (fig. 3 and col. 8, line 34 to

col. 10, line 6), and also discloses using this technique at a WDM EDFA in equalizing the WDM wavelengths (fig. 4 and col. 13, lines 15-36).

Regarding claim 7, Roberts discloses a method according to claim 3, wherein the bandpass filter output signal inherently represents the difference between the bandpass wavelength of the filter and the wavelength of a respective one of the signals passed through the filter.

Regarding claim 8, Roberts discloses a method according to claim 3, including the steps of: using the bandpass filter output signals to generate a power density signal representing the spectral power density of said set of optical signals and using the power density signal to adjust said spectral power density in response to changes in said power density (col. 11, line 1 to col. 12, line 40).

Regarding claim 9, Roberts discloses a method according to claim 3, including the steps of: processing the bandpass filter output signals to generate a further signal proportional to the magnitude and the direction of the difference between the passband wavelength of the filter and the wavelength of one of the signals passed through the filter; and using said further signal to adjust the optical network or the set of optical signals to compensate for said changes in the optical spectrum (col. 11, line 1 to col. 12, line 40).

Regarding claim 10, Roberts discloses a method according to claim 9, further comprising the step of dithering at least one of the optical signals at a given rate; and including the steps of: generating an original dither reference signal at said given rate (Roberts: col. 7, lines 34-59).

Regarding claim 11, Roberts discloses an optical control monitor at an EDFA comprising: a receiver for receiving a set of optical signals, each of the optical signals having a respective wavelength; and a tracking circuit to track changes to said set of signals, including a filter having a bandpass function, means for dithering each wavelength of the set of optical

signals relative to a filter bandpass, and to pass each of the optical signals with dithering center wavelength through the filter to generate filter output signals, and a control for using the filter output signals to make a defined adjustment to compensate for said changes to maintain a defined optical transfer function in the network (fig. 4, and col. 3, lines 51-62, col. 4, lines 4-40, and col. 12, line 41 to col. 13, line 63).

Regarding claim 15, Roberts discloses an optical control monitor according to claim 11, wherein the bandpass filter output signal inherently represents the difference between a bandpass wavelength of the filter and the wavelength of a respective one of the signals passed through the filter.

Regarding claim 16, Roberts discloses an optical control monitor according to claim 11, wherein the control includes: means to use the filter output signals to generate a power density signal representing the spectral power density of said set of optical signals and means to use the power density signal to make the defined adjustment in response to changes in said power density (Roberts: col. 11, line 1 to col. 12, line 40).

Regarding claim 17, Roberts discloses an optical control monitor according to claim 11, wherein the control includes: a dither source for generating a dither signal and a mixer for mixing the dither signal with at least one of the filter output signals (Roberts: col. 7, lines 34-59).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1, 2, 4-6, 12-14 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts (US Patent No. 5513029) in view of Jones et al. (US Patent No. 6208441).

Regarding claim 1, Roberts discloses a method of tracking and compensating for changes in a multi-channel, dense wavelength division multiplexing (DWDM) network, comprising employing a dither feedback mechanism and dithering the center wavelength of each channel in use about the center of an optical bandpass to obtain a measurement of the optical transfer function (OTF) in the network at any instant in real-time, wherein, when the network configuration is changed, the resulting change in the OTF is tracked and feedback signals are used to compensate for the change to maintain a defined optical transfer function in the network (fig. 4, and col. 3, lines 51-62, col. 4, lines 4-40, and col. 12, line 41 to col. 13, line 63). Roberts discloses equalizing a wavelength's power by tapping the wavelength and using dither signal feedback at an inline EDFA (fig. 3 and col. 8, line 34 to col. 10, line 6), and also using this technique at a WDM EDFA in equalizing the WDM wavelengths (fig. 4 and col. 13, lines 15-36), but does not disclose adding/dropping wavelengths at an add/drop node, and thus does not disclose the dither feedback configuration using add/drop optical filters. Jones et al. disclose a WDM add/drop node where an add/drop wavelength is filtered from the main signal and tapped, the tap detected for use in controlling the balance of add/drop channel power and pre-emphasis of the WDM signal at the add/drop node (fig. 1 and col. 4, lines 21-51 and col. 6, lines 49-63). It would have been obvious to one of ordinary skill in the art at the time of the invention that an inline add/drop node could be used in the system of Roberts by modifying the tapped feedback configuration of the inline EDFA of Roberts, and the respective wavelength power balancing teaching of Roberts, with the add/drop node teaching of Jones et al., using add/drop filtering and tapping the add/drop wavelength, as taught by Jones et al., in order to

provide the benefit of being able to add/drop select wavelengths at various points in the route between the two WDM terminals of Roberts while maintaining wavelength power balancing.

Regarding claim 2, the combination of Roberts and Jones et al. discloses a method according to claim 1, wherein the feedback mechanism is based on a wavelength locked loop and allows a spectral decomposition with very fast response corrections (Roberts: col. 11, line 1 to col. 12, line 40).

Regarding claim 4, Roberts discloses a method according to claim 3, and discloses equalizing a wavelength's power by tapping the wavelength and using dither signal feedback at an inline EDFA (fig. 3 and col. 8, line 34 to col. 10, line 6), and also using this technique at a WDM EDFA in equalizing the WDM wavelengths (fig. 4 and col. 13, lines 15-36), but does not discloses add/drop in optical network, passing at least some of the optical signals through the filter of the optical control monitor. Jones et al. disclose a WDM add/drop node where an add/drop wavelength is removed/added with a filter, the remaining wavelengths passed without being removed/added, and the add/drop wavelength tapped, the tap detected for use in controlling the balance of add/drop channel power and pre-emphasis of the WDM signal at the add/drop node (fig. 1 and col. 4, lines 21-51 and col. 6, lines 49-63). It would have been obvious to one of ordinary skill in the art at the time of the invention that an inline add/drop node could be used in Roberts by modifying the tapped feedback configuration of the inline WDM EDFA of the combination, with the add/drop node teaching of Jones et al., in order to provide the benefit of being able to add/drop select wavelengths at various points in the route between the two WDM terminals, passing the remaining wavelengths, while maintaining wavelength power balancing.

Regarding claim 5, Roberts discloses a method according to claim 3 and discloses equalizing a wavelength's power by tapping the wavelength and using dither signal feedback at

an inline EDFA (fig. 3 and col. 8, line 34 to col. 10, line 6), and also using this technique at a WDM EDFA in equalizing the WDM wavelengths (fig. 4 and col. 13, lines 15-36), but does not disclose dropping optical signals from the network, including the step of adjusting the set of optical signals or the network to compensate for the dropping of optical signals from the network. Jones et al. disclose a WDM add/drop node where an add/drop wavelength is removed/added with a filter and the drop signal is tapped, the tap detected for use in controlling the balance of add/drop channel power and controlling the power offset relative to the drop power for optimum adjustment in asymmetric system topographies (fig. 1 and col. 4, lines 21-51 and col. 6, lines 49-63). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the add/drop node teaching of Jones et al. with Roberts as described above for claim 4.

Regarding claim 6, Roberts discloses a method according to claim 3 and discloses equalizing a wavelength's power by tapping the wavelength and using dither signal feedback at an inline EDFA (fig. 3 and col. 8, line 34 to col. 10, line 6), and also using this technique at a WDM EDFA in equalizing the WDM wavelengths (fig. 4 and col. 13, lines 15-36), but does not disclose the step of adding optical signals to the network, including the step of adjusting the set of optical signals or the network to compensate for the adding of optical signals to the network. Jones et al. disclose a WDM add/drop node where an add/drop wavelength is removed/added with a filter and the add signal is tapped, the tap detected for use in controlling the balance of add/drop channel power and controlling the add power to be consistent with the system pre-emphasis (fig. 1 and col. 4, lines 21-51 and col. 6, lines 49-63). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the add/drop node teaching of Jones et al. with Roberts as described above for claim 4.

Regarding claim 12, Roberts discloses an optical control monitor according to claim 11 and discloses equalizing a wavelength's power by tapping the wavelength and using dither signal feedback at an inline EDFA (fig. 3 and col. 8, line 34 to col. 10, line 6), and also using this technique at a WDM EDFA in equalizing the WDM wavelengths (fig. 4 and col. 13, lines 15-36), but does not discloses that that the bandpass filter is adapted to add or drop optical signals from the network. Jones et al. disclose a WDM add/drop node where an add/drop wavelength is removed/added with a filter and the add/drop signal is tapped, the tap detected for use in controlling the balance of add/drop channel power and controlling the add power to be consistent with the system pre-emphasis (fig. 1 and col. 4, lines 21-51 and col. 6, lines 49-63). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the add/drop node teaching of Jones et al. with Roberts as described above for claim 4.

Regarding claim 13, the combination of Roberts and Jones et al. discloses an optical control monitor according to claim 12, where an add/drop wavelength is removed/added with a filter and the drop signal is tapped, the tap detected for use in controlling the balance of add/drop channel power and controlling the power offset relative to the drop power for optimum adjustment in asymmetric system topographies (Jones et al: fig. 1 and col. 4, lines 21-51 and col. 6, lines 49-63).

Regarding claim 14, the combination of Roberts and Jones et al. discloses an optical control monitor according to claim 12, where an add/drop wavelength is removed/added with a filter and the add signal is tapped, the tap detected for use in controlling the balance of add/drop channel power and controlling the add power to be consistent with the system pre-emphasis (Jones et al.: fig. 1 and col. 4, lines 21-51 and col. 6, lines 49-63).

Regarding claim 18, Roberts discloses a system for tracking and compensating for changes in a multi-channel dense wavelength division multiplexing (DWDM) network, comprising means for dithering the wavelength of each channel relative to a filter bandpass, and to pass each dithered channel through the filter to generate filter output signals, and a tracking circuit to track changes to the WDM channel set, and a control for using the filter output signals to make a defined adjustment to compensate for the changes to the WDM channel set, to maintain a defined optical transfer function in the network (fig. 4, and col. 3, lines 51-62, col. 4, lines 4-40, and col. 12, line 41 to col. 13, line 63; and col. 7, lines 34-59 which dither source teaching applies for each wavelength of the fig. 4 WDM system). Roberts discloses a system for equalizing a wavelength's power by tapping the wavelength and using dither signal feedback at an inline EDFA (fig. 3 and col. 8, line 34 to col. 10, line 6), and also a WDM EDFA using the same technique in equalizing the WDM wavelengths (fig. 4 and col. 13, lines 15-36), but does not disclose a WDM add/drop unit. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teaching of Jones et al. with Roberts as described above for claim 1.

Regarding claim 19, the combination of Roberts and Jones et al. discloses a combination add unit and drop unit according to claim 18, wherein the control includes: a second dither source for generating a dither signal; and a mixer for mixing the dither signal with the at least one of the filter output signals (Roberts: col. 7, lines 34-59).

Regarding claim 20, the combination of Roberts and Jones et al. discloses a combination according to claim 19, wherein: the first dither source dithers said at least one of the optical signals at a given rate; and the second dither source dithers the dither signal at said given rate (Roberts: col. 7, lines 34-59).

Response to Arguments

9. Applicant's arguments filed 15 June 2006 have been fully considered but they are not persuasive.

The applicant argues that the prior art does not disclose important features of applicant's claimed invention, such as calculating "the vector inner product of the filtered, dithered optical signal with the original dither reference, providing "a frequency doubles signal when the filter and laser are locked", and using "an un-encoded dither signal" without a microcontroller. However, these arguments are not persuasive because none of these features are claimed.

The applicant also argues that Roberts discloses features that are not required by the applicant. However, this argument is not persuasive because it is not relative to whether or not Roberts reads on the claims.

The applicant states that Roberts is controlling the optical power, not wavelength, of the laser sources by direct modulation and that Roberts dithers the amplitude of each signal. However, the applicant is not correct, because although Roberts is interested in optical power, Roberts specifically discloses that the dithering broadens the spectrum of the signal (col. 3, lines 51-62). This is a disclosure of wavelength control and dithering the wavelength. Roberts measures signal power after the dithered wavelengths pass through fixed wavelength selective filters.

The applicant also argues against the Epworth reference with respect to dithering a filter bandpass. However, these arguments are moot because the amended claims now claim dithering wavelengths with respect to a filter bandpass instead of claiming dithering a filter bandpass.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

11. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (800) 786-9199.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR system, see http://pairdirect.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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